

for CDMA communication links, to spread the user data symbols over the transmission bandwidth. This practical application is believed to satisfy the requirement in 35 U.S.C. 101.

### 3. Claim Rejections - 35 USC § 112

Amended claims 7-9 are believed to clearly describe the construction of the hybrid Walsh complex codes and the generalized hybrid Walsh codes to replace the current real Walsh codes and their implementation in CDMA communications to spread the data symbols over the transmission bandwidth, to satisfy the 35 U.S.C. 112 requirement that "The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention".

The motivation is the generally accepted axiom in communications that complex signal processing and coding is better than real. From their unique construction using the correspondences of frequency and sequency, even and odd codes, and the construction of the complex discrete Fourier Transform (DFT) codes from the real set of Fourier transform codes, it is believed that the hybrid Walsh codes are the best approximation to the DFT codes that is possible for an orthogonal set of complex codes whose phase states are restricted to the 4 phases  $\{1, j, -1, -j\}$ . A  $(-45)$  degree rotation and a rescaling transforms the hybrid Walsh to these phases  $\{-1, j, -1, -j\}$ . With some exceptions the common code lengths are powers of 2 which means  $N=2, 4, 8, 16, 32, 64, \dots$ . A much larger choice in the length  $N$  of the code is possible using the generalized hybrid Walsh which has the inherent disadvantage of requiring some multiply operations. Application requirements may dictate quasi-orthogonal codes and/or codes with arbitrary lengths for which the generalized hybrid Walsh codes are candidates.

**4. Claim Rejections - 35 USC § 112**

Claim 9 has been amended to particularly point out and distinctly claim the subject matter which I regard as the invention.

**5. Claim Rejections - 35 USC § 112**

In claim 9 the sufficient antecedent basis for "said Hadamard", "said Walsh", and "said DFT" has been provided in claim 7.

Thanks ever for spending the time and resources to re-write the claims in a language and format suitable for a patent..

Sincerely,

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